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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY  
(Chapter II of the Patent Cooperation Treaty)

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(PCT Article 36 and Rule 70)

Applicant's or agent's file reference gy 0054 wo	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416	
International application No. PCT/SE2003/001850	International filing date (day/month/year) 01-12-2003	Priority date (day/month/year) 02-12-2002
International Patent Classification (IPC) or national classification and IPC B01L 3/00, G01N 35/00, B81B 1/00		
Applicant GYROS AB et al		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 5 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
  - ☐ (sent to the applicant and to the International Bureau) a total of \_\_\_\_\_ sheets, as follows:
    - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

- This report contains indications relating to the following items:

- |  |   |
|--|---|
| <input checked="" type="checkbox"/> Box No. I  | Basis of the report   |
| <input type="checkbox"/> Box No. II            | Priority  |
| <input type="checkbox"/> Box No. III           | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability  |
| <input checked="" type="checkbox"/> Box No. IV | Lack of unity of invention  |
| <input checked="" type="checkbox"/> Box No. V  | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI            | Certain documents cited   |
| <input type="checkbox"/> Box No. VII           | Certain defects in the international application  |
| <input type="checkbox"/> Box No. VIII          | Certain observations on the international application   |

Date of submission of the demand  01-07-2004	Date of completion of this report  01-03-2005
Name and mailing address of the IPEA/SE Patent- och registreringsverket Box 5055 S-102 42 STOCKHOLM Facsimile No. +46 8 667 72 88	Authorized officer  Gordana Ninkovic /itw Telephone No. +46 8 782 25 00

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/SE2003/001850

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☒ the international application as originally filed/furnished
- ☐ the description:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the claims:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
- pages \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to the sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## Box No. IV Lack of unity of invention

1. In response to the invitation to restrict or pay additional fees the applicant has:

- ☐ restricted the claims.  
☐ paid additional fees.  
☐ paid additional fees under protest.  
☐ neither restricted nor paid additional fees.

2. ☒ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is:

- ☐ complied with.  
☒ not complied with for the following reasons:

The application contains two independent inventions, namely:

Invention 1, claims 1-6:

An arrangement for rotating one or more microfluidic devices. The devices are attached to seats on a rotary member. The seats are positioned at the same radial distance. The internal microconduit portion, of the microfluidic device, has an upstream part positioned at a shorter radial distance than a downstream part when the microfluidic device is placed in any of the seats.

Invention 2, claims 7-19:

A microfluidic device comprising one or more equal microchannel structures. Each of the inlet ports is present on an edge side of the device. The wettability of the inner walls of the inlet permits penetration by self-suction of a predetermined volume of an aqueous liquid.

These inventions are not so linked as to form a single general inventive concept. There is no technical relationship among these two inventions involving a corresponding technical feature. Accordingly, the inventions 1 and 2 do not fulfil the requirements for unity.

4. Consequently, this report has been established in respect of the following parts of the international application:

- ☒ all parts.  
☐ the parts relating to claims Nos. \_\_\_\_\_

**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement****1. Statement**

Novelty (N)	Claims	<u>1-19</u>	YES
	Claims		NO
Inventive step (IS)	Claims	<u>1-6, 8-9, 13-14</u>	YES
	Claims	<u>7, 10-12, 15-19</u>	NO
Industrial applicability (IA)	Claims	<u>1-19</u>	YES
	Claims		NO

**2. Citations and explanations (Rule 70.7)****Documents cited in the International Search Report:**

D1 WO 0153794 A1 (Northeastern University), 26 July 2001  
D2 EP 1156325 A1 (Matsushita Electric Industrial Co Ltd), 21 November 2001  
D3 EP 0693560 A2 (Becton Dickinson and Company), 24 January 1996  
D4 WO 0053317 A1 (Biomerieux S.A.), 14 September 2000  
D5 US 5627041 A (R.J.Shartle), 6 May 1997

The most relevant documents are D1 and D2. Documents D3-D5 represent the state of the art.

Document D1 describes a sample load and injection device for parallel transfer of liquid samples into channels of a multi channel microfluidic device. The device includes parallel sample introduction capillaries attached to a microfluidic device into which the sample load and injection device are integrated (see figures 1 and 2 and page 10, lines 2-12).

Document D2 discloses a biosensor comprising a cavity into which a liquid sample is introduced and sucked by capillarity into contact with a reagent layer, where a reaction of the reagent with a constituent of the sample takes place (see abstract).

The invention defined in claims 1 - 6 is not disclosed by any of these documents.

The cited prior art does not give any indication that would lead a person skilled in the art to the claimed microfluid arrangement.

.../...

## Supplemental Box

In case the space in any of the preceding boxes is not sufficient.  
Continuation of Box V

Therefore, the claimed invention is not obvious to a person skilled in the art.

Accordingly, the invention defined in claims 1 - 6 is novel and is considered to involve an inventive step.

The invention as defined in claim 7 differs from what is known from D1, which is considered to represent the closest prior art, in that sample introduction into the claimed microfluidic device is promoted by capillarity. It is however considered as obvious for a person skilled in the art that liquid in contact with a capillary is drawn into the capillary due to capillarity, as disclosed in the document D2. Since cited documents relate to the same technical field, the person skilled in the art would use directions from document D2 to modify the device according to document D1 and thus arrive to the invention according to claim 7. Since no unexpected technical effect has been achieved, what is claimed in claim 7 is not considered to involve an inventive step. Therefore, the subject matter of claim 7 is considered as obvious application of known art.

What is further claimed in dependent claims 10-12 and 15-19 is considered to constitute details obvious for a person skilled in the art.

The invention defined in claims 8-9 and 13-14 is not disclosed by any of these documents. Accordingly, the invention defined in these claims is novel and is considered to involve an inventive step.

The claimed invention is regarded to be industrially applicable.